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branous bag, and the copper in a surrounding solution of sulphate of copper, the proportion of zinc to copper was as one to eight, the impediment to the passage of the current being double in the latter case what it was in the former.

*“ Fifth Experiment.*

“ Five cylinders of zinc, 10 inches high,  $\frac{1}{2}$  diameter, were placed in glass vessels, containing sulphuric acid, as before. Into these were placed cylindrical earthenware vessels,  $1\frac{1}{2}$  inches diameter, containing pure nitric acid ; slips of platina foil were rolled into cylinders as before.

	Cubic Inches.
Time, 2 minutes, . . . . .	2.0
After 10 „ . . . . .	2.5
„ 30 „ . . . . .	3.0*

“ From these data may be calculated the heights of the zinc pipes, and the weight of platina foil required to obtain any given decomposition, to be employed, as shewn by Jacobi, either as a motive power, or applied to light-houses, to the polariscope, or to the fusion of refractory substances. For the latter purposes, I had fixed to a strong, shallow woof bottle, two tubes with glass cocks, and to them tubes containing chloride of calcium, applied to a Daniell’s jet, playing upon a cylinder of lime, rotated by clock work. A third tube was inserted in the bottle, intended as a regulation of the pressure, or a safety valve, in case of explosion.”

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Dr. Apjohn then made a brief verbal communication on the subject of the Composition of Pyrope. This mineral, long

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\* “ The dilute acid in the voltameter began to boil ; the cause of the increase of decomposition, compared to what took place in the small cylinder, was the small stratum of sulphuric acid between the porous vessel and the zinc. For a continuous action the zinc pipes, sealed at one end and amalgamated, should be connected by pipes at top and bottom, with an earthenware vessel, containing the sulphuric acid.”

confounded with garnet, is known to be distinguished from it by containing chrome, and by exhibiting, not the dodecahedral, but the hexahedral form. The best analyses of it, however, which are by Kobel and Wachtmiester, are obviously imperfect, of which no better proof can be given than that Gustavus Rose, in his Crystallography, does not attempt to give the formula of the mineral, but contents himself with enumerating the different oxides of which it is composed. Under these circumstances, Dr. Apjohn conceived that a re-examination of the constitution of pyrope would not be without interest. He, therefore, undertook its analysis; and the result has been that he has detected in it yttria, one of the rarest of the earths; one, in fact, which had previously been known to exist only in a few minerals of exceeding scarcity. The yttria was insulated in the following manner.

The mineral being fused with carbonate of potash, and the silice separated in the usual way, the peroxide of iron, alumina, and yttria were precipitated together by a mixed solution of ammonia and sal-ammoniac. The alumina was taken up by caustic potash; and to the iron and yttria, dissolved in a minimum of muriatic acid, such a quantity of tartaric acid was added, that upon subsequently pouring in ammonia in excess there was no precipitate produced. The iron was now removed by sulphuretted hydrogen; and the solution evaporated to dryness, and ignited in a large platinum crucible, so as to volatilize the ammoniacal salts, and burn away the carbon of the tartaric acid, left the *yttria* slightly coloured by oxide of chrome. From this latter substance it is separated, but not perfectly, by the action of a dilute acid, and by the addition of ammonia, or caustic potash, to the solution the yttria is again recovered. That the substance thus obtained is yttria seems proved by the following considerations.

It is separated, though not completely, from acids by

ammonia largely diluted with sal-ammoniac, and hence cannot be one of the alkaline earths.

It is insoluble in potash, and is, therefore, not alumina or glucina. After ignition it dissolves readily in dilute acids, and is hence not zirconia or thorina. From zirconia it is further distinguished by its saline solutions, being precipitated by ferrocyanide of potassium.

It is not oxide of cerium, for it does not redden in the exterior flame of the blow-pipe, and because its salts are not precipitated by the sulphate of potash. The quantity of the yttria amounts to at least 3 per cent.

Dr. A. is still engaged in investigating the composition of pyrope; and expressed his intention of bringing his results on a future occasion in a more detailed form under the notice of the Academy, when he hoped also to be able to assign the true formula of the mineral.

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Mr. J. Huband Smith exhibited to the Academy an ancient monastic seal, from an impression of which the annexed wood engraving is taken.

This seal has been for some time supposed to have been that of the Dean and Chapter of Lismore, and it was recently found among the effects of the late Rev. Sir George Bisshopp, formerly Dean of Lismore; but the legend around the seal shews this supposition to be totally groundless.

It reads thus: "SIGILLVM : CAPITVLI : PRIORIS : ET : CONVENTVS : DE : BVLLYNGIONA." It surrounds the figures of the Virgin and Child. She appears seated, and wearing a highly ornamented crown; her robe, which falls in gracefully arranged folds, displays no inconsiderable degree of skill and tastefulness of design. In her right hand is a star of five rays, intended possibly to represent the star of Bethlehem, to which the infant Saviour points. It is observable that his head displays the ecclesiastical tonsure. The seal is of